

REMARKS

The Office Action dated August 8, 2006 ("Office Action") has been received and noted. Claims 1-29, 31, 32 and 36 were examined. Claims 1-29, 31, 32 and 36 were rejected. Claims 1, 12 and 21 are amended. Support for amended claims 1, 12 and 21 can be found in, for example, FIGS. 2C-2D. As such, no new matter has been added. Claims 1-29, 31-32 and 36 remain in the application.

Claims 1, 5-8, 12, 16-17, 21, 25 and 26 were objected to due to informalities. The Examiner objects to the term "attack barrier layer" even though this term has been consistently used throughout the prosecution of this Application and has not been previously objected to. The term "attack barrier layer" is introduced into the specification on page 8, line 20. It is described in more detail in the Detailed Description beginning on page 19, paragraph 2 of the Application. Applicants respectfully remind the Examiner that an Applicant is his own lexicographer. [CITE] The term "a lost portion of the etch stop layer" has been removed. Applicants respectfully request withdrawal of the Examiner's objections.

Claims Rejected Under 35 U.S.C. § 103

A.

Claims 1-5, 7-20, 31 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art ("AAPA") in view of U.S. Pat. Pub. No. 2003/0137051 to Kawai ("*Kawai*"). In order to establish a *prima facie* case of obviousness: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference; (2) there must be a reasonable expectation of success; and (3) the references when combined must teach or suggest all of the claim limitations. MPEP 2142. Applicant respectfully submits that a *prima facie* case of obviousness has not been established.

More particularly, the cited references in combination do not teach or suggest all of the claim limitations. Amended independent claims 1 and 12 include the limitation of "wherein an attack barrier layer formed between the second plug and the conductive patterns removes a gap

formed when the second contact hole is formed.” Thus, according to claims 1 and 12, the attack barrier layer fills a gap that is formed when the second contact hole is etched. (see, App. at p.20, lns. 1-2; FIG. 2B) In contrast, *Kawai* teaches that “first insulating film 4 is etched . . . to flatten surfaces of the first insulating film 4 and the first conductive plug 7.” (see ¶ [0138]; FIG. 15c) The etching process used in *Kawai* does not form a gap in first insulating film 4. (*Id.*) Thus, when first etching prevention film 24 is formed, “[t]he first etching prevention film 24 has a flat surface without unevenness because it is formed on a flat surface, where the surfaces of the first insulating film 4 and the first conductive film 7 are flat.” (see ¶ [0140]; FIG. 16a) In other words, there is no gap for first etching prevention film 24 to fill. (see FIGS. 15c, 16a) The AAPA does not cure this lack of teaching or suggestion because the AAPA does not include an attack barrier layer that fills a gap that is formed when the second contact hole is etched. (see App., FIGS. 1A-1D) Accordingly, the AAPA in view of *Kawai* do not teach or suggest all of the claim limitations of independent claims 1 and 12. Dependent claims 2-5 and 7-11 depend on independent claim 1 and therefore include all of its limitations. Dependent claims 13-20 depend on independent claim 12 and therefore include all of its limitations.

Moreover, there is no motivation to combine the references for at least the reasons that (a) the Examiner has used impermissible hindsight to combine the references and (b) the references teach away from their combination. MPEP 2145(X)(A)&(D). Specifically, one skilled in the art would not look to *Kawai* in solving the problem presented in the AAPA because the etching process taught in *Kawai* does not present a problem that an etch process forms a gap in first insulating film 4, as discussed previously. To the contrary, the first insulating film 4 in *Kawai* is described as “flat”. (see ¶ [0140]) It is irrelevant that first etching prevention film 24 has a high etch selectivity rate with respect to first insulating film 4 (see ¶ [0142]) because the problem presented in the AAPA and *Kawai* are totally different. As such, combining the AAPA with *Kawai* is impermissible hindsight.

In addition, the references teach away from their combination because the problem in the AAPA relates to preventing an electrical “short” between a first plug and a second plug due to a gap formed during a prior etching process. This electrical short is a main factor of failure in the prior art. The problem is solved in the present invention by adding an attack barrier layer to fill in

the gap. (claims 1, 12) However, because the first etching prevention film 24 in *Kawai* relates a “flat” surface deposition, one skilled in the art would not look to solving the problem presented in the AAPA because *Kawai* teaches away from their combination.

In view of the above remarks, Applicants respectfully submit that independent claims 1 and 12 and their respective dependent claims are allowable over the cited references.

B.

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants’ Admitted Prior Art (“AAPA”) in view of U.S. Pat. No. 6,696,336 to DeBoer et al. (“*DeBoer*”). The cited references in combination do not teach or suggest all of the claim limitations for at least the reasons stated previously. *DeBoer* does not cure this lack of teaching or suggestion because the etch process in *DeBoer* does not form a gap in layers adjacent to pads 18 and 20. (see FIGS. 7, 8) Accordingly, Applicants respectfully submit that dependent claim 6 is allowable over the cited references.

C.

Claims 21-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA and *DeBoer*. The cited references in combination do not teach or suggest all of the claim limitations. Amended independent claim 21 includes the limitation of “wherein an attack barrier layer formed between the second plug and the conductive pattern removes a gap formed when the second contact hole is formed.” (claim 21) Thus, according to claim 21, the attack barrier layer fills a gap that is formed when the second contact hole is etched. (see, App. at p.20, lns. 1-2; FIG. 2B) *DeBoer* describes a first blanket dielectric layer 80 and second blanket dielectric layer 82 formed on a structure. (col. 4, lns. 58-65) *DeBoer* does not teach or suggest that the layers 80 and 82 fill in a gap of any underlying layers. Additionally, although misalignment occurs when a contact hole is formed, the layers 80 and 82 cannot fill into a partial region of a sidewall space layer of the gate pattern removed by misalignment of the contact hole due to the oxide layer 22. (FIG. 9) Accordingly, in view of the arguments presented with respect to amended independent claims 1 and 12, the references when combined do not teach or suggest all of the claim limitations of amended claim 21. Dependent claims 22-29 depend on independent claim 21 and

therefore include all of the limitations of independent claim 21. Accordingly, Applicants respectfully submit that independent claim 21 and its dependent claims are allowable over the cited references.

CONCLUSION


In view of the foregoing, Applicant believes that all claims now pending patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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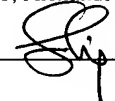
Dated: November 2, 2006

By 
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on November 2, 2006.


Si Vuong